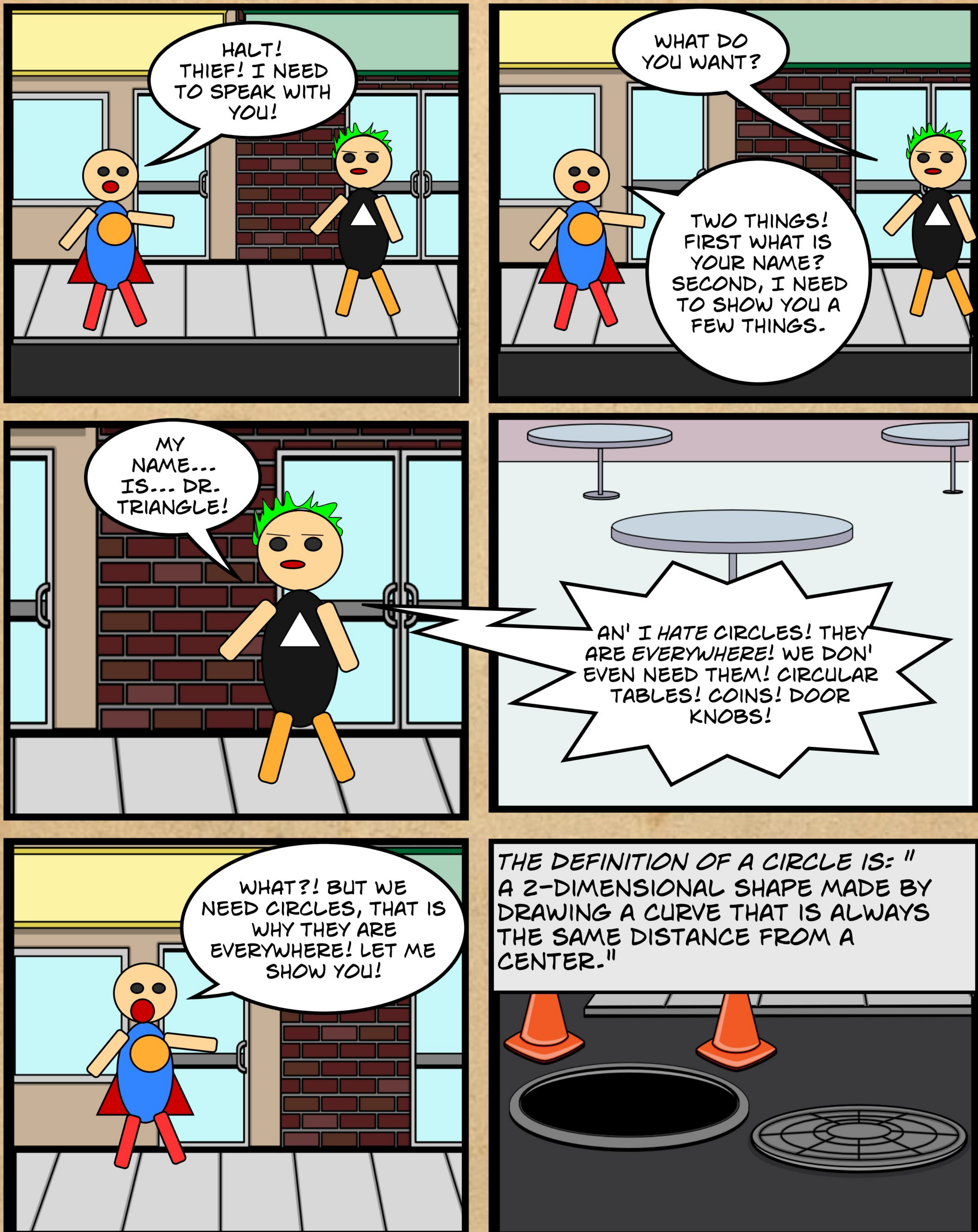
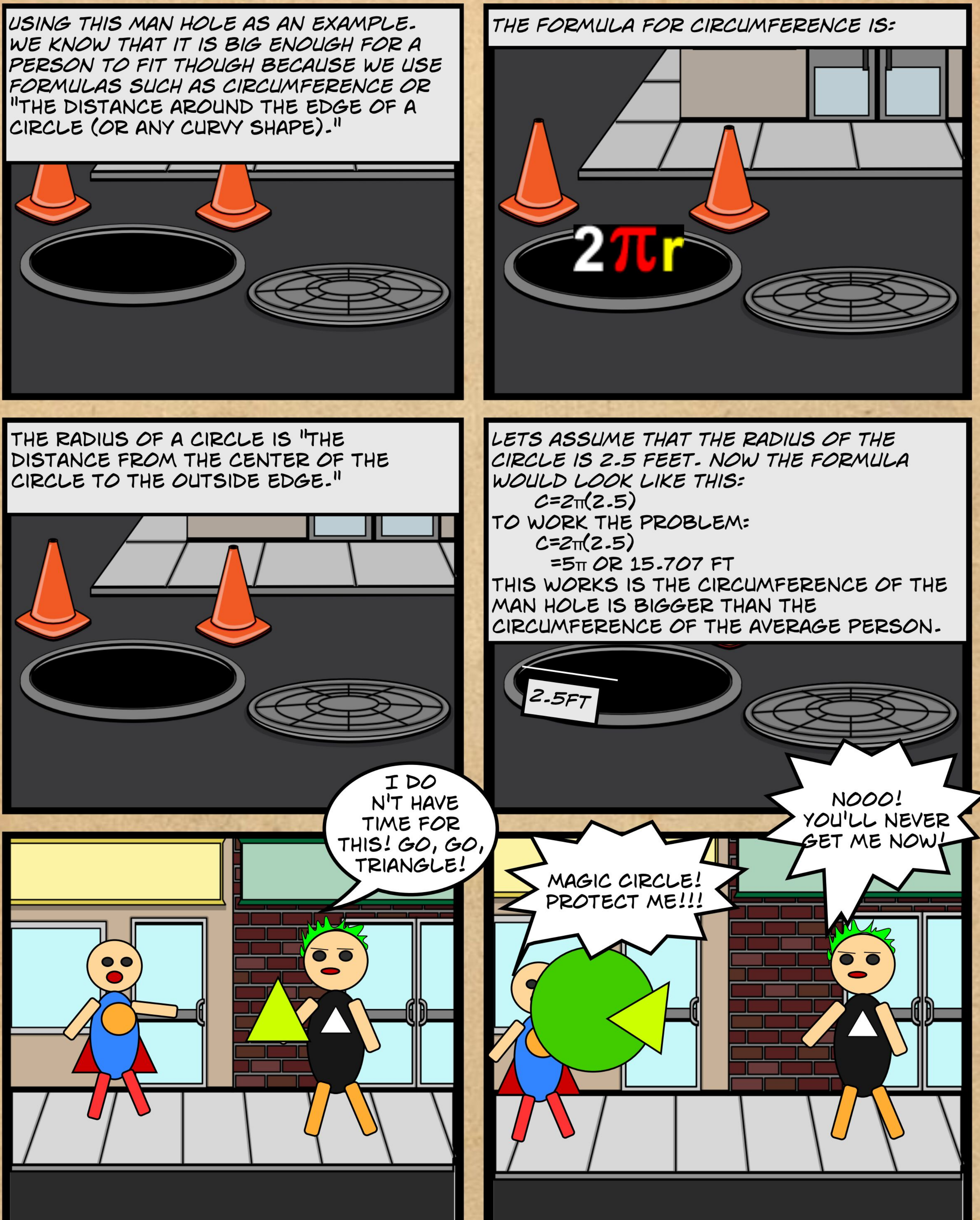
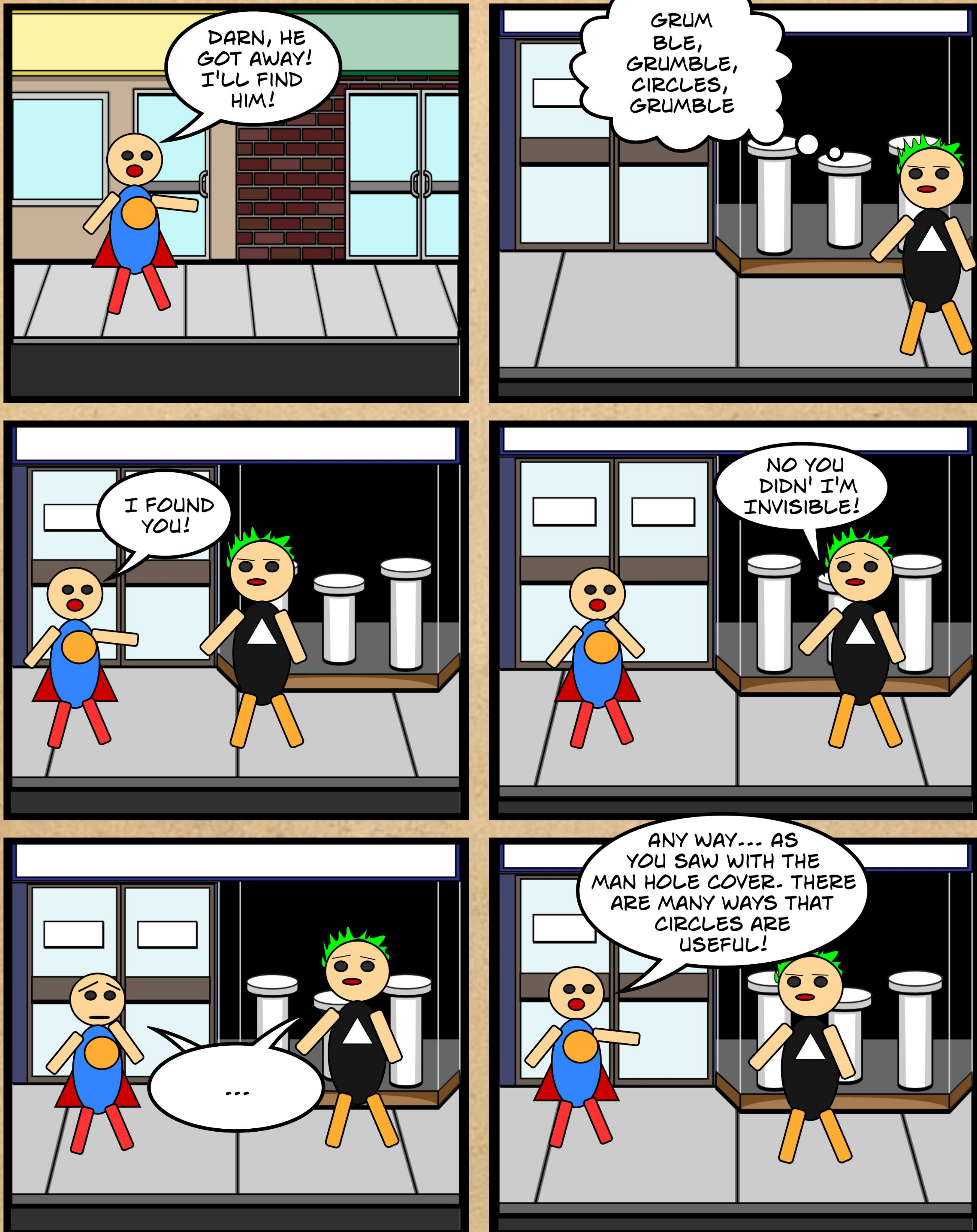
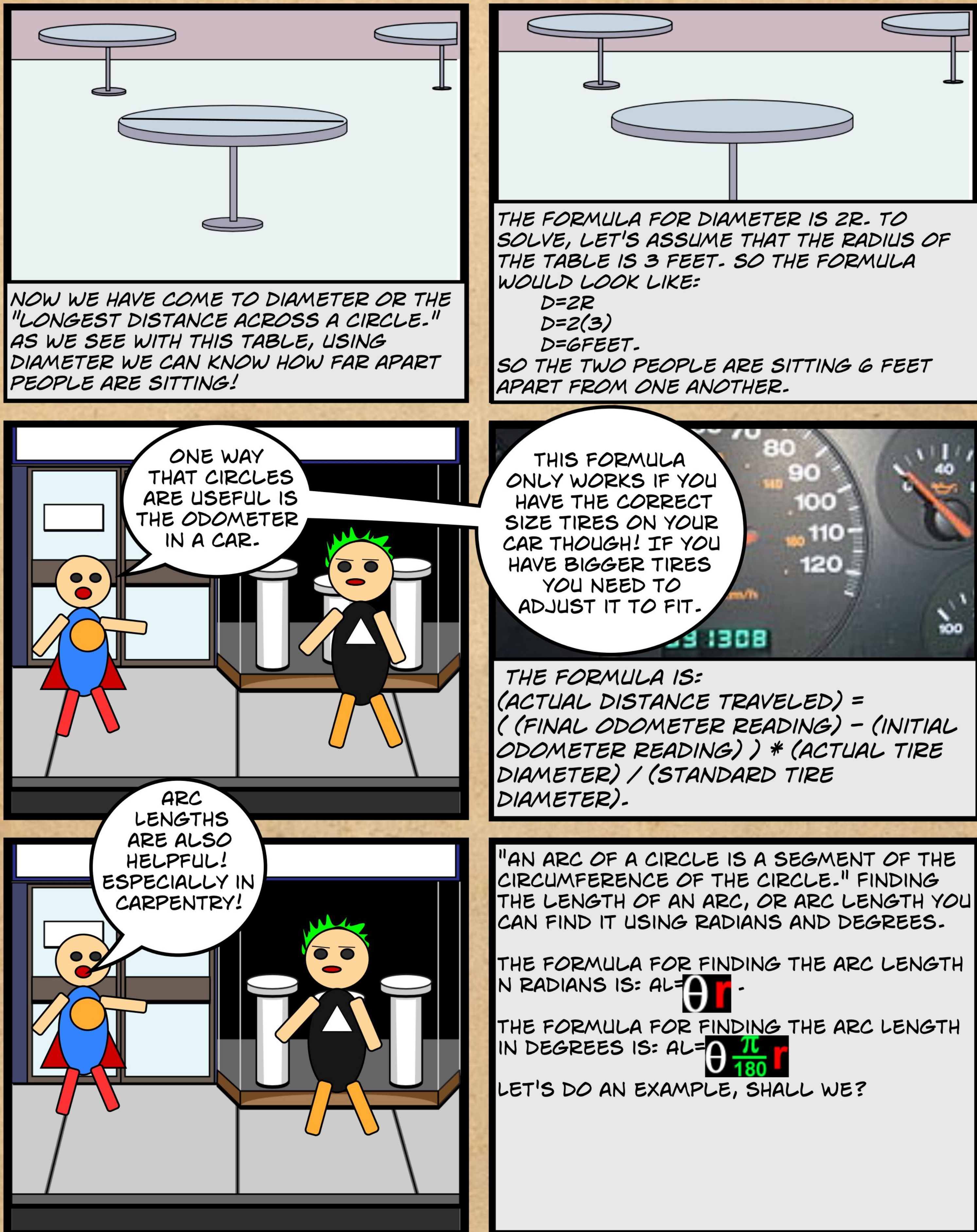
THE MYSTERY OF THE MISSING CIRCELS

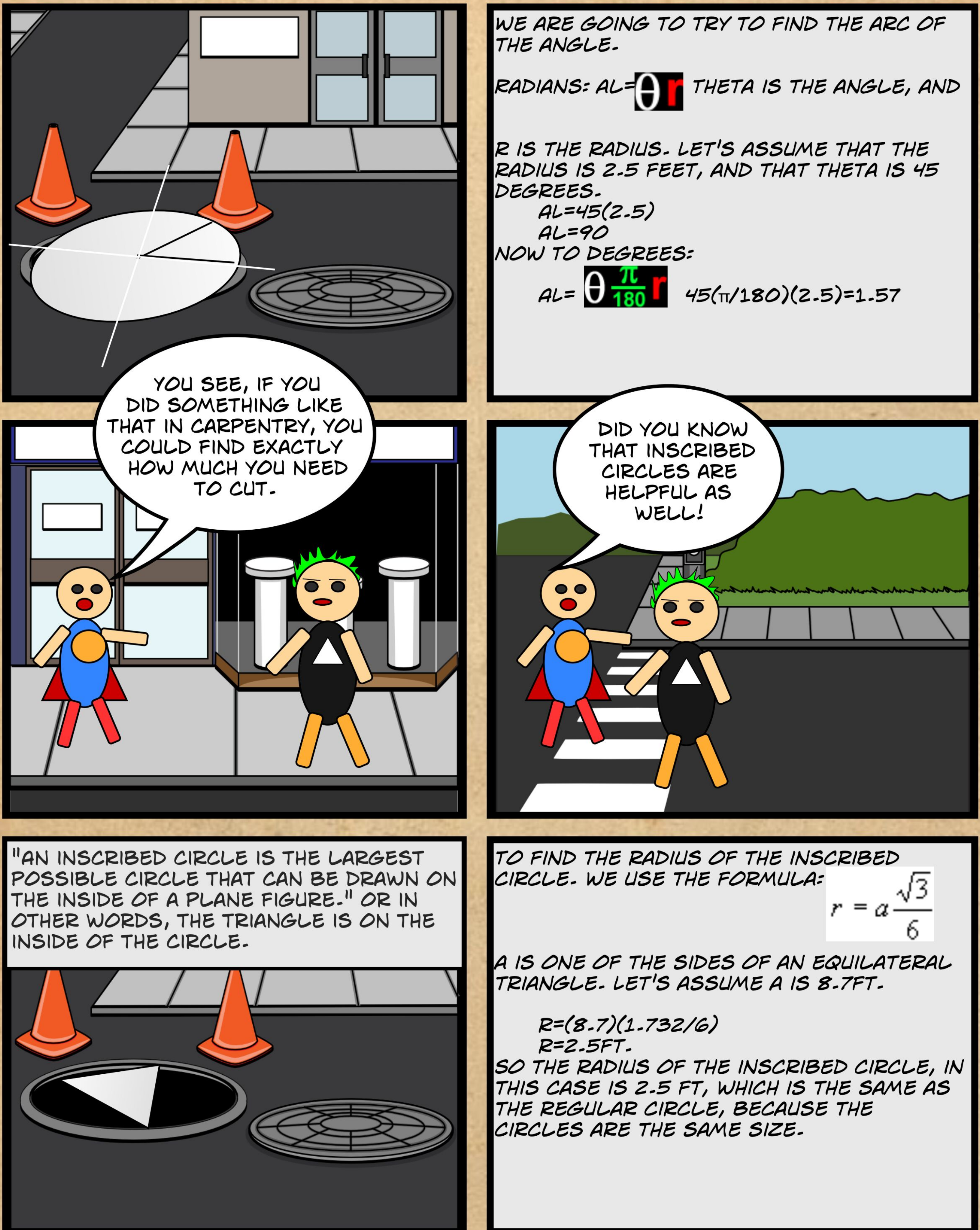

HALT! THIEF! I NEED TO SPEAK WITH YOU!
WHAT DO YOU WANT?
TWO THINGS! FIRST WHAT IS YOUR NAME? SECOND, I NEED TO SHOW YOU A FEW THINGS.
MY NAME... IS... DR. TRIANGLE!
AN' I *HATE* CIRCLES! THEY ARE *EVERYWHERE*! WE DON' EVEN NEED THEM! CIRCULAR TABLES! COINS! DOOR KNOBS!
WHAT?! BUT WE NEED CIRCLES, THAT IS WHY THEY ARE EVERYWHERE! LET ME SHOW YOU!
THE DEFINITION OF A CIRCLE IS: " A 2-DIMENSIONAL SHAPE MADE BY DRAWING A CURVE THAT IS ALWAYS THE SAME DISTANCE FROM A CENTER."

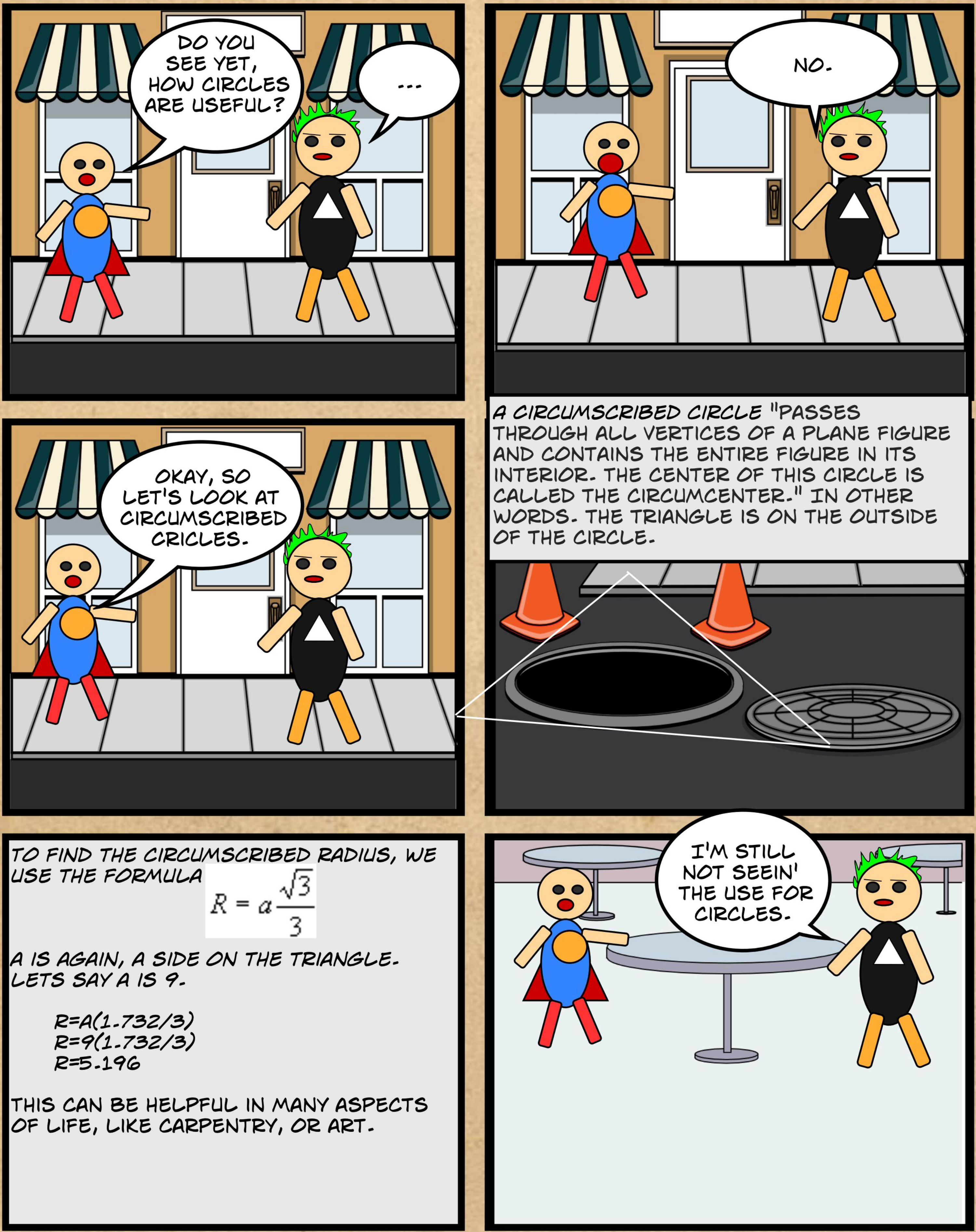


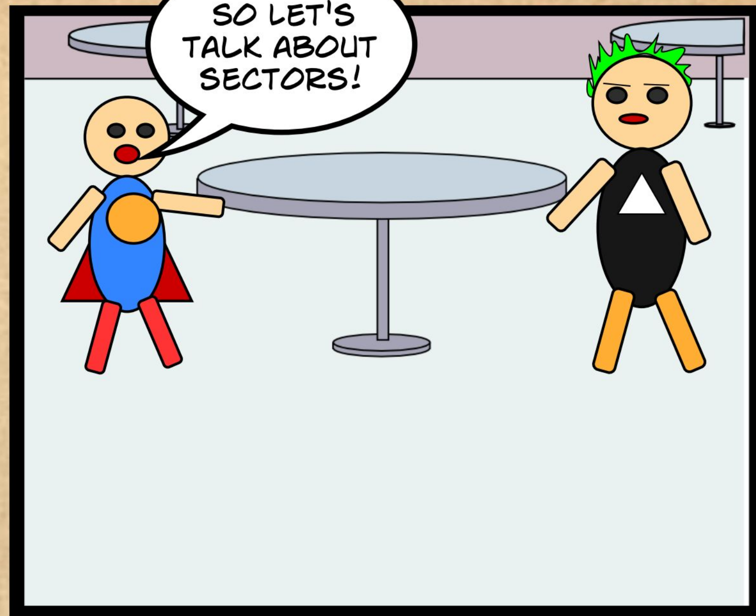
USING THIS MAN HOLE AS AN EXAMPLE. WE KNOW THAT IT IS BIG ENOUGH FOR A PERSON TO FIT THOUGH BECAUSE WE USE FORMULAS SUCH AS CIRCUMFERENCE OR "THE DISTANCE AROUND THE EDGE OF A CIRCLE (OR ANY CURVY SHAPE)."
THE FORMULA FOR CIRCUMFERENCE IS:
$2\pi r$
THE RADIUS OF A CIRCLE IS "THE DISTANCE FROM THE CENTER OF THE CIRCLE TO THE OUTSIDE EDGE."
LETS ASSUME THAT THE RADIUS OF THE CIRCLE IS 2.5 FEET. NOW THE FORMULA WOULD LOOK LIKE THIS:
$C=2\pi(2.5)$
TO WORK THE PROBLEM:
$C=2\pi(2.5)$
$=5\pi$ OR 15.707 FT
THIS WORKS IS THE CIRCUMFERENCE OF THE MAN HOLE IS BIGGER THAN THE CIRCUMFERENCE OF THE AVERAGE PERSON.
2.5FT
I DO N'T HAVE TIME FOR THIS! GO, GO, TRIANGLE!
MAGIC CIRCLE! PROTECT ME!!!
NOOO! YOU'LL NEVER GET ME NOW!


DARN, HE GOT AWAY! I'LL FIND HIM!
GRUM BLE, GRUMBLE, CIRCLES, GRUMBLE
I FOUND YOU!
NO YOU DIDN' I'M INVISIBLE!
...
ANY WAY... AS YOU SAW WITH THE MAN HOLE COVER- THERE ARE MANY WAYS THAT CIRCLES ARE USEFUL!

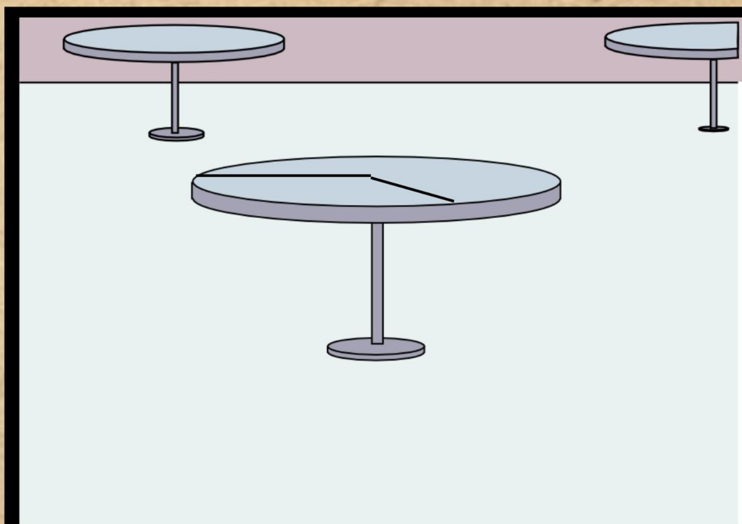

NOW WE HAVE COME TO DIAMETER OR THE "LONGEST DISTANCE ACROSS A CIRCLE." AS WE SEE WITH THIS TABLE, USING DIAMETER WE CAN KNOW HOW FAR APART PEOPLE ARE SITTING!
THE FORMULA FOR DIAMETER IS 2R. TO SOLVE, LET'S ASSUME THAT THE RADIUS OF THE TABLE IS 3 FEET. SO THE FORMULA WOULD LOOK LIKE:
D=2R
D=2(3)
D=6FEET.
SO THE TWO PEOPLE ARE SITTING 6 FEET APART FROM ONE ANOTHER.
ONE WAY THAT CIRCLES ARE USEFUL IS THE ODOMETER IN A CAR.
THIS FORMULA ONLY WORKS IF YOU HAVE THE CORRECT SIZE TIRES ON YOUR CAR THOUGH! IF YOU HAVE BIGGER TIRES YOU NEED TO ADJUST IT TO FIT.
80
90
100
110
120
40
100
1308
THE FORMULA IS:
(ACTUAL DISTANCE TRAVELED) = ((FINAL ODOMETER READING) - (INITIAL ODOMETER READING)) * (ACTUAL TIRE DIAMETER) / (STANDARD TIRE DIAMETER).
ARC LENGTHS ARE ALSO HELPFUL! ESPECIALLY IN CARPENTRY!
"AN ARC OF A CIRCLE IS A SEGMENT OF THE CIRCUMFERENCE OF THE CIRCLE." FINDING THE LENGTH OF AN ARC, OR ARC LENGTH YOU CAN FIND IT USING RADIANS AND DEGREES.
THE FORMULA FOR FINDING THE ARC LENGTH N RADIANS IS: AL=θr.
THE FORMULA FOR FINDING THE ARC LENGTH IN DEGREES IS: AL=$\theta \frac{\pi}{180} r$
LET'S DO AN EXAMPLE, SHALL WE?


WE ARE GOING TO TRY TO FIND THE ARC OF THE ANGLE.
RADIANS: AL=θr THETA IS THE ANGLE, AND
R IS THE RADIUS. LET'S ASSUME THAT THE RADIUS IS 2.5 FEET, AND THAT THETA IS 45 DEGREES.
AL=45(2.5)
AL=90
NOW TO DEGREES:
AL= θ π/180 r 45(π/180)(2.5)=1.57
YOU SEE, IF YOU DID SOMETHING LIKE THAT IN CARPENTRY, YOU COULD FIND EXACTLY HOW MUCH YOU NEED TO CUT.
DID YOU KNOW THAT INSCRIBED CIRCLES ARE HELPFUL AS WELL!
"AN INSCRIBED CIRCLE IS THE LARGEST POSSIBLE CIRCLE THAT CAN BE DRAWN ON THE INSIDE OF A PLANE FIGURE." OR IN OTHER WORDS, THE TRIANGLE IS ON THE INSIDE OF THE CIRCLE.
TO FIND THE RADIUS OF THE INSCRIBED CIRCLE. WE USE THE FORMULA: r = a √3/6
A IS ONE OF THE SIDES OF AN EQUILATERAL TRIANGLE. LET'S ASSUME A IS 8.7FT.
R=(8.7)(1.732/6)
R=2.5FT.
SO THE RADIUS OF THE INSCRIBED CIRCLE, IN THIS CASE IS 2.5 FT, WHICH IS THE SAME AS THE REGULAR CIRCLE, BECAUSE THE CIRCLES ARE THE SAME SIZE.


DO YOU SEE YET, HOW CIRCLES ARE USEFUL?
...
NO.
OKAY, SO LET'S LOOK AT CIRCUMSCRIBED CRICLES.
A CIRCUMSCRIBED CIRCLE "PASSES THROUGH ALL VERTICES OF A PLANE FIGURE AND CONTAINS THE ENTIRE FIGURE IN ITS INTERIOR. THE CENTER OF THIS CIRCLE IS CALLED THE CIRCUMCENTER." IN OTHER WORDS. THE TRIANGLE IS ON THE OUTSIDE OF THE CIRCLE.
TO FIND THE CIRCUMSCRIBED RADIUS, WE USE THE FORMULA $R = a\frac{\sqrt{3}}{3}$
A IS AGAIN, A SIDE ON THE TRIANGLE. LETS SAY A IS 9.
R=A(1.732/3)
R=9(1.732/3)
R=5.196
THIS CAN BE HELPFUL IN MANY ASPECTS OF LIFE, LIKE CARPENTRY, OR ART.
I'M STILL NOT SEEIN' THE USE FOR CIRCLES.



"A SECTOR OF A CIRCLE IS A PIE SHAPED PORTION OF THE AREA OF THE CIRCLE. TECHNICALLY, THE PIECE OF PIE IS BETWEEN TWO SEGMENTS COMING OUT OF THE CENTER OF THE CIRCLE." IT'S ALMOST LIKE AN ARC LENGTH!



SO THAT IS A SECTOR OF THE TABLE!

THE FORMULA TO FIND THE AREA OF A SECTOR IN RADIANS IS:

SA= $\frac{\theta}{2} r^2$ THETA IS THE ANGLE OF THE CIRCLE, AND R IS THE RADIUS.

LET'S ASSUME THAT THE RADIUS IS 3 FEET AND THETA IS 45 DEGREES.

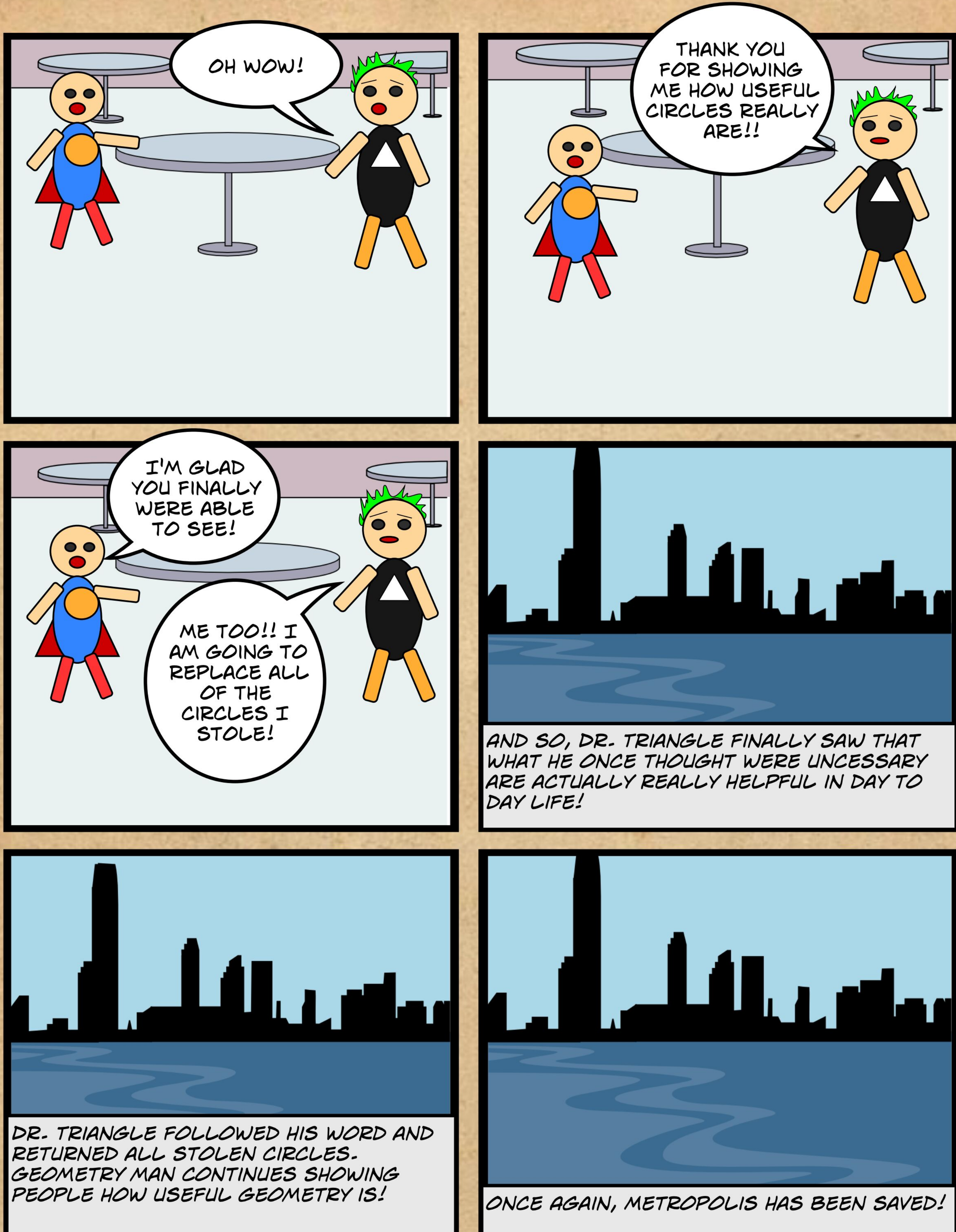
SA=45/2(3*3)
SA=2.5(9)
SA=22.5FEET

NOW IF WE WANTED TO SAY, BUY A TABLE TO PUT ON A CORNER, THAN WE KNOW HOW TO FIND THE PERFECT TABLE.

THE FORMULA TO FIND THE AREA OF A SECTOR IN DEGREES IS: $\frac{\theta}{360} \pi r^2$

LET'S KEEP THE SAME THETA AND RADIUS.

SA=45/360(π)(3*3)
SA=.125(π)(9)
SA=28.27


OH WOW!
THANK YOU FOR SHOWING ME HOW USEFUL CIRCLES REALLY ARE!!
I'M GLAD YOU FINALLY WERE ABLE TO SEE!
ME TOO!! I AM GOING TO REPLACE ALL OF THE CIRCLES I STOLE!
AND SO, DR. TRIANGLE FINALLY SAW THAT WHAT HE ONCE THOUGHT WERE UNCESSARY ARE ACTUALLY REALLY HELPFUL IN DAY TO DAY LIFE!
DR. TRIANGLE FOLLOWED HIS WORD AND RETURNED ALL STOLEN CIRCLES. GEOMETRY MAN CONTINUES SHOWING PEOPLE HOW USEFUL GEOMETRY IS!
ONCE AGAIN, METROPOLIS HAS BEEN SAVED!

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